

REMARKS

Applicants have amended claims 1 and 32 to more particularly point out and distinctly claim the subject matter which they regard as their invention. Applicants have also corrected minor deficiencies in claims 1¹, 2, 12, and 32, canceled claims 13-31, 33-36, and 38-41, and withdrawn claim 37. Finally, anticipating rejoinder of method claim 37, which corresponds to compound claim 1, Applicants have amended claim 37 in the same manner as claim 1 following the procedure set forth in MPEP § 821.04. No new matter has been introduced in the above amendments.

Upon entry of the proposed amendments, claims 1-12 and 32 will be under examination. Reconsideration of the application, as amended, is requested in view of the remarks below.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 1-12 and 32 are rejected as being indefinite on six grounds. See the Office Action, pages 4-5. Applicants traverse each ground as follows:

(1) The Examiner points out that “[i]n claims 1 and 32, under the definition of R_a and R_b, “cyano, haloalkyl” should be changed to “cyano or haloalkyl.” See the Office Action, page 4, lines 6-8. Applicants have corrected this deficiency in both claims.

(2) The Examiner indicates that “[i]n claim 3, R₄ representing a cyano substituted phenyl lacks antecedent basis.” See the Office Action, page 4, lines 8-9. Applicants have assigned “phenyl optionally substituted with cyano” to R₄ recited in claim 1, from which claim 3 depends. Applicants submit that, with this amendment, a cyano substituted phenyl recited in claim 3 no longer lacks antecedent basis.

(3) The Examiner points out that “[c]laim 4 lacks antecedent basis from claim 2 because R₂ does not represent an optionally substituted phenyl in claim 2.” See the Office Action, page 4, lines 9-11. Applicants have included the term “optionally” between the words “phenyl” and “substituted” recited in claim 2 and submit that R₂ recited in claim 2, thus amended, includes an optionally substituted phenyl.

¹ Support for adding “cyano” to claim 1 can be found in original claim 3.

(4) The Examiner indicates that “[c]laim 7 lacks antecedent basis from claim 2 because R₂ does not represent an optionally substituted phenyl in claim 2.” See the Office Action, page 4, lines 12-14. As mentioned in (3) above, Applicants have corrected this deficiency in claim 2.

(5) The Examiner points out that “[i]n claim 10, R₄ representing a cyano substituted phenyl lacks antecedent basis.” See the Office Action, page 4, lines 14-15. As mentioned in (2) above, Applicants have provided antecedent basis for a cyano substituted phenyl in claim 1, from which claim 10 depends.

(6) The Examiner indicates that “[i]n claim 12, a number of species are not embraced by claim 1 and, therefore, lack antecedent basis from claim 1.” See the Office Action, page 4, lines 15-17. Applicants have rewritten claim 12 in independent form.

For the reasons set forth above, Applicants submit that claims 1-12 and 32 are no longer indefinite and request that this rejection be withdrawn.

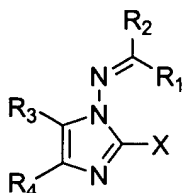
Rejection under 35 U.S.C. § 102

The Examiner rejects claims 1, 2, and 10 for anticipation on two grounds. See the Office Action, pages 5-7. Applicants traverse each ground as follows:

I

Claims 1, 2, and 10 are rejected under 35 U.S.C. § 102(a) as being anticipated by four references: (1) CA registry No. 388609-03-8, (2) CA registry No. 388093-36-5, (3) CA registry No. 352656-72-5, and (4) Miyamoto, Journal of Heterocyclic Chemistry, 2002, 39(1), 157-162 (“Miyamoto”). See the Office Action, page 5, line 17 to page 6, line 7.

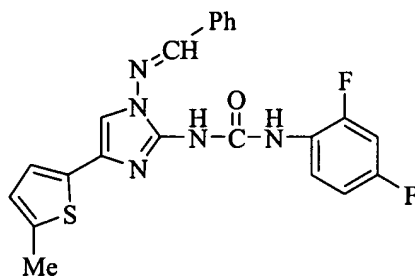
Applicants discuss independent claim 1 first. Claim 1, as amended, covers compounds of the following formula (“formula (I)”):



In formula (I), R₂ is hydrogen, alkyl, cycloalkyl, cycloalkenyl, phenyl, thienyl, thiazolyl, anthryl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, nitro, or alkoxy; and R₄ is

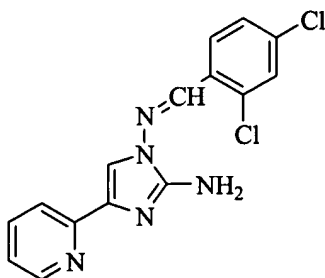
thienyl, pyridinyl, thiazolyl, anthryl, naphthyl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, nitro, or alkoxy when R₂ is thienyl, thiazolyl, anthryl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, nitro, or alkoxy; is pyridinyl, thiazolyl, anthryl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, cyano, nitro, or alkoxy when R₂ is phenyl optionally substituted with hydroxy, alkyl, haloalkyl, or alkoxy; is thiazolyl, anthryl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, nitro, or alkoxy when R₂ is phenyl optionally substituted with chloro, bromo, iodo, or nitro; is phenyl optionally substituted with hydroxy, halo, alkyl, haloalkyl, cyano, nitro, or alkoxy when R₂ is phenyl substituted with fluoro, alkyl, or haloalkyl; or is cycloalkyl, cycloalkenyl, or heterocyclyl optionally substituted with hydroxy, halo, alkyl, cyano, nitro, haloalkyl or alkoxy when R₂ is hydrogen, alkyl, cycloalkyl, cycloalkenyl, thienyl, thiazolyl, anthryl, or quinolyl, optionally substituted with hydroxy, halo, alkyl, haloalkyl, or alkoxy.

CA registry No. 388609-03-8 discloses a compound of the following formula:



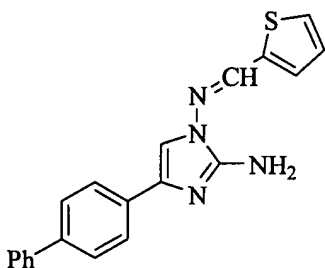
In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl and the group corresponding to R₄ of formula (I) is thienyl substituted with methyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not thienyl substituted with methyl. Thus, amended claim 1 is not anticipated by CA registry No. 388609-03-8.

CA registry No. 388093-36-5 discloses a compound of the following formula:



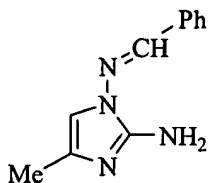
In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl substituted with chloro (i.e., 2,4-dichlorophenyl) and the group corresponding to R₄ of formula (I) is pyridinyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl substituted with chloro, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) thiazolyl, anthryl, or quinolyl, not pyridinyl. Thus, amended claim 1 is not anticipated by CA registry No. 388093-36-5.

CA registry No. 352656-72-5 discloses a compound of the following formula:



In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or thienyl, and the group corresponding to R₄ of formula (I) is diphenyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or thienyl, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) thienyl, pyridinyl, thiazolyl, anthryl, naphthyl, or quinolyl, not diphenyl. Thus, amended claim 1 is not anticipated by CA registry No. 352656-72-5.

Miyamoto discloses an annelation reaction of certain imidazole compounds. It discloses compound 1a that is structurally closest to those of amended claim 1. Compound 1a has the following formula:



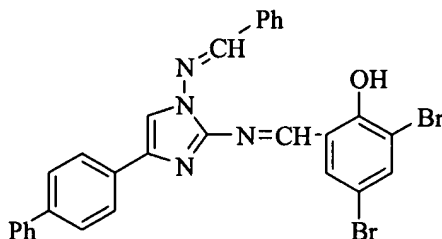
In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl, and the group corresponding to R₄ of formula (I) is methyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not methyl. Thus, amended claim 1 is not anticipated by Miyamoto.

For the reasons set forth above, amended claim 1 is not anticipated by CA registry No. 388609-03-8, CA registry No. 388093-36-5, CA registry No. 352656-72-5, and Miyamoto. Neither are claims 2 and 10, both of which depend from claim 1.

II

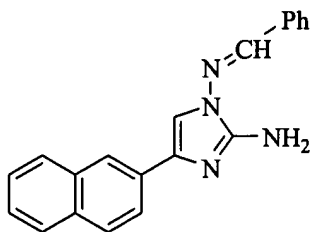
Claims 1 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by four references: (1) CA registry No. 319429-16-8, (2) CA registry No. 53454-64-1, (3) Harmon et al., Journal of Pharmaceutical Sciences, 1970, 59(5), 724 ("Harmon"), and (4) Krimer et al., Khimiya Geterotsiklicheskikh Soedinenii, 1996, 9, 1209-1213 ("Krimer"). See the Office Action, page 6, line 10 to page 7, line 5.

CA registry No. 319429-16-8 discloses a compound of the following formula:



In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl, and the group corresponding to R₄ of formula (I) is diphenyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not diphenyl. Thus, amended claim 1 is not anticipated by CA registry No. 319429-16-8.

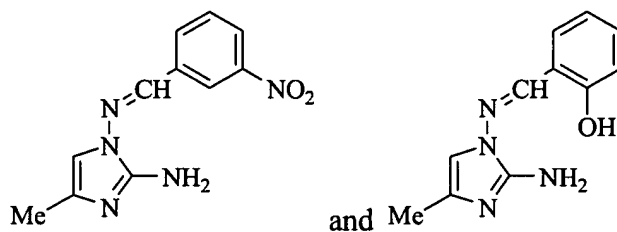
CA registry No. 53454-64-1 discloses a compound of the following formula:



In this compound, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl, and the group corresponding to R₄ of formula (I) is naphthyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not naphthyl. Thus, amended claim 1 is not anticipated by CA registry No. 53454-64-1.

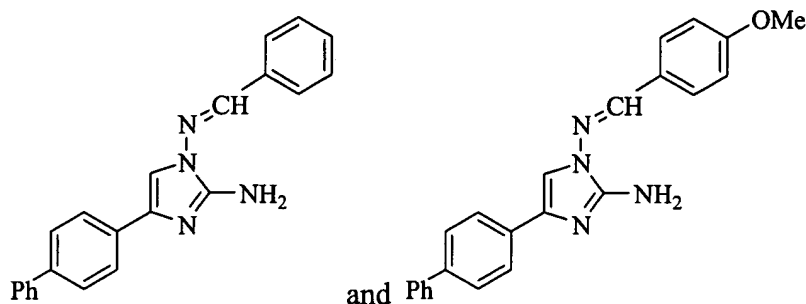
Harmon discloses the cytotoxic activity of certain imidazole compounds. It discloses two compounds, i.e., compounds 7 and 8, that are structurally closest to those of amended claim 1.

See Table 1. These two compounds have the following formulas:



In these two compounds, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl substituted with nitro or hydroxy (i.e., *m*-nitrophenyl or *o*-hydroxyphenyl), and the group corresponding to R₄ of formula (I) is methyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl substituted with nitro or hydroxy, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not methyl. Thus, amended claim 1 is not anticipated by Harmon.

Krimer discloses a number of imidazole compounds. Among them, two compounds are structurally closest to those of amended claim 1. They have the following formulas:



In these two compounds, the group corresponding to R₂ of formula (I) of amended claim 1 is H or phenyl optionally substituted with methoxy (i.e., phenyl or 4-methoxyphenyl), and the group corresponding to R₄ of formula (I) is diphenyl. By contrast, when R₂ of formula (I) of amended claim 1 is H or phenyl optionally substituted with methoxy, R₄ of formula (I) is either (1) cycloalkyl, cycloalkenyl, or heterocyclyl, or (2) pyridinyl, thiazolyl, anthryl, or quinolyl, not diphenyl. Thus, amended claim 1 is not anticipated by Krimer.

For the reasons set forth above, amended claim 1 is not anticipated by CA registry No. 319429-16-8, CA registry No. 53454-64-1, Harmon, and Krimer. Neither is claim 10 dependent from claim 1.

CONCLUSION

Applicants submit that the grounds for rejection asserted by the Examiner have been overcome, and that claims 1-12 and 32, as pending, define subject matter that is definite and novel. On this basis, it is submitted that all claims are now in condition for allowance, an action of which is requested.

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Attorney's Docket No.: 12563-019001

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Respectfully submitted,

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